
Women's Health: Nutrition

Obesity

C. WAYNE CALLAWAY, MD

Dr. Callaway is the Director of the Center for Clinical Nutrition of the George Washington University Medical Center, Washington, DC. The paper is based on his presentation at the National Conference on Women's Health, held in Bethesda, MD, June 17-18, 1986.

Synopsis

Obesity is not a single disease, but a variety of conditions resulting from different mechanisms and associated with various types and degrees of risks. To determine who should lose weight, how much weight should be lost, and how to undertake weight loss, the following types of information are needed:

*personal-demographic data
developmental patterns
family history
energy balance
body composition/fat distribution
psychological/behavioral measures
endocrine/metabolic measures
complications and associated conditions*

Weight reduction should be undertaken by women with morbid obesity, with complications secondary to the obesity, with a strong family history of conditions associated with obesity, or with increased abdomen:hip ratios. In contrast, women who have excess weight localized in the hips and thighs and no personal or

family history of associated conditions may not benefit from dietary restriction.

Low calorie diets result in adaptive changes, "designed" to prolong survival in the face of famine. These include changes in water balance, metabolic rate, and appetite. Metabolic rate declines, allowing the individual to burn fewer and fewer calories. Each time a woman diets she tends to lose weight less rapidly than the time before. "Restrained eating" predisposes binge eating. Indeed, bulimia rarely occurs in the absence of prior caloric restrictions.

Current medical definitions of obesity do not consider these nuances. Existing definitions "over-diagnose" obesity in women, in general, and in older women and nonwhite women, in particular. For example, by existing standards, more than 60 percent of black women more than 45 years of age are considered obese. In contrast, the health risks of similar degrees of obesity are substantially greater for men than for women. Part of the problems lies in the fact that many women have pear-shaped fat distribution, a pattern which is not associated with increased health risks.

Current cultural definitions of obesity for women distort the picture even further. In the past 20 years, there has been a progressive decline in the weight-for-height of such "culture models" as Playboy centerfold subjects and Miss America contestants. Attempting to achieve such low weights predisposes women to an endless cycle of dieting and regaining, and contributes to the growing problems of eating disorders, including anorexia nervosa and bulimia.

IN THE MATTER OF obesity, women's magazines and newspapers in this country often are substantially ahead of the more orthodox medical press. Those media have publicized the growing prevalence of anorexia and bulimia and other eating disorders. At the same time, the New York Times and the American Medical News have published the results of a Harris poll, paid for by Prevention magazine, which discovered that only 21 percent of adults who were 25 years of age were within recommended weight ranges, and 62 percent of adults were overweight, up 3 percent from 3 years ago. At that rate, in 15 years, there will not be a problem; everyone will be overweight.

But this paradox of increasing eating disorders on the one hand and increasing obesity (at least by current definitions) on the other requires explanation. Perhaps more reliable data come from the Public Health Service's National Center for Health Statistics and recently published provisional data from the National Health Interview Survey conducted between January and June 1985, which reported that 25 percent of men and 50 percent or more of women were at least trying to lose weight through some combination of diet and exercise.

If this paradox exists, then there is something wrong. In early 1985 at a National Institutes of

Health consensus development conference on the issue of obesity, the first question that was asked of the panel was, what is obesity? Several definitions were provided; none was recommended. One suggestion was the use of the 1959 Metropolitan Life Insurance tables, another the 1983 tables. A third definition, perhaps closer to reality, was based on data from the National Health and Nutrition Examination Surveys; it identified the 85th percentile as a cutoff point for obesity. This definition has the virtue of being based on a representative population sample from the United States, but the subjects were 20 to 29 years of age, and most people get heavier as they get older.

Dr. Reuben Anders, of the National Institute on Aging, has looked at the issue of the actuarial data, the insurance data, and has argued that average weight tends to be optimal weight and average weight tends to increase with age. So if standards that are based on 20-year-olds are used, there is already a bias to a definition that results in an overdiagnosis of obesity in people as they get older.

Part of the problem with definitions of obesity is the complication of other conditions including hypertension, diabetes, and even osteoporosis. None of these conditions is a single disorder. All are interrelated. In terms of obesity, multiple factors can be related to its cause, and obesity can result in a variety of complications; however, not everyone who is the same weight for height is equally susceptible to complications.

For instance, if we use the insurance tables, an individual can be within the appropriate weight range and still have elevated blood sugar, hypertension, or high serum cholesterol or triglyceride levels. That person would definitely benefit from weight reduction, even though the person's weight is normal according to the tables. Such an individual could be referred to as metabolically obese, at normal weight.

In contrast, some people come from families in which body size is genetically large. In spite of exercise and appropriate diet, they may still be well above the appropriate weight ranges in the tables. But if their fat cell sizes are examined they are actually normal or smaller than normal. If insulin levels are measured, they are normal. These people do not have any of the complications. Such people are metabolically normal, even though overweight.

At the other extreme, are people who are naturally lean. There is no particular advantage to fattening them. If you do try to do it, first it is difficult to do, because the more you feed them, the more they burn; secondly, if they do increase their weight by increasing their fat cell size, there is resistance to insulin and

a greater tendency for metabolic abnormalities to occur, especially diabetes and high serum triglyceride levels.

One of the problems, then, is the issue of heterogeneity. At present there is no good way to classify obesity. Instead of trying to develop *a priori* classifications, much of the work in this area is aimed at characterizing or describing different factors that may be involved in obesity, both its causation and in determining who should lose weight, how much they should lose, and how they should undertake weight loss.

Concerning personal and demographic data, perhaps as much as a third of the variance in body weight in the United States can be accounted for by differences in socioeconomic status.

Developmental patterns also are important. If weight was put on in early childhood and has been there through adolescence, for example, the individual often has not only greater body weight, but greater lean body mass, more fat cells. Appropriate weight goals for a person who has early onset obesity may be substantially higher than for the person who has simply led a sedentary life for most of his adult life.

Developmental patterns may also give some clues about consequences. Hypertension, in particular, is associated with obesity in children and adolescents.

Family history is important for two reasons. Is there a family history of obesity? Is there a family history of complications? The risk factors, especially for cardiovascular disease, tend to cluster in families. In families where diabetes is found in several members, high triglyceride levels and hypertension are more likely to be found. In a family in which there is a history of these complications, it would be more appropriate to be aggressive in recommending weight maintenance or weight reduction early than in a family where all lived to be 80 in spite of apparent obesity.

Concerning energy balance, the assumption that fat people are fat because they eat too much is widespread, but very difficult to demonstrate. For example, caloric data were collected from adolescents in Rochester, MN. The adolescents were grouped as thin, muscular, or fat. Although there was an enormous *range* in caloric intake by these youngsters, the *average* caloric intake did not differ very much among the three groups.

In data from David McCarron and his colleagues, who looked at the NHANES data (National Health and Nutrition Examination Survey) there was an inverse relationship: thinner people were eating more than fatter people.

Within the obese group, there are some obese people who eat a great deal and some who eat very little. In data from the Mayo Clinic, only about 20 percent of the obese patients in the nutrition clinic were found to be eating more than predicted or more than the average. About two-thirds of women were actually skipping meals and dieting and were eating less than had been predicted. If someone who is already eating relatively little diets even more, it seems to be a counterproductive exercise.

Eating patterns themselves may be important. People who skip two meals a day burn less (metabolic rate measured first thing in the morning) than people who skip one meal a day, who burn less than people who have a tiny breakfast or who eat as many as three or even six meals a day. About one-third of the variance in resting energy expenditure (how many calories are burned) could be accounted for just by meal pattern alone. In addition, following each meal there is an increase in metabolic rate, and about 10 percent of one's calories are burned in the 3 or 4 hours after each meal.

Concerning body composition, distribution of fat is important. The pear distribution of fat, which is a typically feminine fat distribution that develops in adolescence and pregnancy and is associated with increased *numbers* of fat cells (not necessarily increased *size* of fat cells), probably carries with it little health risk when compared to the upper trunk, the abdominal distribution, what used to be called male distribution. We are concerned with increased abdominal fat that is associated with increased fat cell size, with resistance to insulin, and with a much greater risk of diabetes, hypertriglyceridemia, and coronary artery disease.

Recently, some research suggested that this fat pattern distribution is associated with increased insulin levels and that insulin levels themselves, before and after a test meal, may be an independent risk factor for coronary artery disease. So, metabolically, one person can be quite different from another. This is very important when we consider who to treat, especially when we are talking about treating women.

Who should be treated for obesity? There is no argument that a person with morbid obesity, which is usually defined as 100 percent or 100 lb overweight, should be treated. However, if a person has any one of the complications mentioned, even though she is at normal weight, she should be treated with weight reduction programs. If there is a family history of these problems, then one should be much more cautious in trying to keep weight at reasonable levels. If, on the other hand, a person is free from com-

plications and there is a family history of large stature, then it is inappropriate to try to get her to meet arbitrary weight tables.

The most common treatment programs in the United States have been very low calorie diets. Three things happen when one goes on a very low calorie diet. The first is a significant water loss, and this is particularly true if carbohydrates are restricted, because the liver continues to produce glucose by breaking down glycogen and protein, and there are 3 g of water for every gram of glycogen or protein that is broken down.

Most of that weight loss in the first 2 weeks is water loss. If the person is on a semistarvation program, she then begins to have re-feeding edema, which is totally confusing to her. She eats a Chinese meal and gains 5 lb, all of which is water. Thus the diet has gotten the credit for the weight loss, largely water, and she is discouraged by the weight gain, again, largely water.

The second thing that happens is a decline in metabolic rate, as measured by oxygen consumption. The longer a person starves, the less she burns. Recent evidence shows that repeated dieting increases efficiency at adapting to starvation, so with the first diet there is a certain loss rate. The second time, the loss rate is lower. Every time the diet is reinstated, the loss rate is lower and lower. If you think about this from an adaptive point of view, it has tremendous survival value.

The third thing that happens is a change in appetite, which can be illustrated by data taken from a paper by Herman and Pollaby, who studied what they call the "restrained" eater, someone who is always dieting. They studied the restrained eater in a situation where the person was obligated to eat. Restrained eaters and unrestrained eaters were asked to taste ice cream. They were not told that the amount of ice cream eaten was being measured. Instead, they were given other questions to answer, phony questions to distract them. Before they ate the ice cream, they had to drink one milkshake, two milkshakes, or nothing. The nondieters did what was predicted. If they had a milkshake, they ate less ice cream; two milkshakes, they ate even less. The dieters did just the opposite. If they had a milkshake, they ate more ice cream; two milkshakes, they ate even more.

This is not an isolated finding. There are 30 or so papers which show a similar pattern in humans or animals. Herman and Pollaby, who are psychologists, say that this is a psychological phenomenon. The person has been restraining food intake; then he or she breaks the restraint. Now it is harder to

reimpose control. But if you can show this in an experimental dog who has never heard of Freud, who did not grow up in Minnesota, does not know about Lutheran guilt and Garrison Keillor, then the odds are that there is a biological signal.

From an adaptive point of view, animals in the wild behave this way. If they are starving, their metabolic rates go down. When food becomes available, they overeat, lie down, go to sleep. If the wolf is startled, for instance, the animal gets up, vomits, and runs off. So these adaptive biological phenomena are triggered by inappropriate dieting.

One of our problems of confusion, the heterogeneity issue, may be resolved by better definitions. But meanwhile, we are bound by what are, in essence, cultural definitions of obesity.

If we look not only at the weight tables but also at other trends, changes in body weight of models, Miss America contestants, or Playboy centerfolds, over the last 20 years there has been an increase in height with a stable weight, meaning that the cultural ideal has gotten thinner through this time.

If we look at medical definitions, we find that the definition is heavily dependent upon culturally specific technologies, such as, weight tables, and that by relying on something which is arbitrary rather than based on more functional definitions, we are medi-

cally encouraging people to follow the cultural trend, which is to diet more and more, and there is good evidence now that people who have eating disorders, bulimia, for example, rarely have developed them without antecedent dieting.

Then we face the paradox: the more we try to diet, the more we find eating disorders. We find that the more people try to diet, the better they become at adapting, the harder it is to lose, and the more likely they are to gain back more than they lost. It appears that the yo-yo phenomenon is not simply lose 10 lb, gain 10 lb, but more like lose 10 lb, gain 12 lb, and each time dieting occurs, it becomes more and more difficult to lose weight.

A redefinition of obesity is urgently needed. Our current definitions discriminate against women more than men, and then we have this paradox that the same amount of obesity in a woman is not as hazardous as the same amount of obesity in men.

Our current definitions discriminate against older people, and they discriminate against black women, in particular. Even if one uses the most conservative definition, 60 percent of black women over 45 years of age are considered obese, and some 35 percent of white women over 45 years of age are considered obese.

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Nutrition and Health— An Individual Responsibility

JANICE M. DODDS, EdD

Dr. Dodds is the Director of the Nutrition Surveillance Program of the New York State Department of Health, Albany, NY. The paper is based on her presentation at the National Conference on Women's Health, held in Bethesda, MD, June 17-18, 1986.

Synopsis

The report of the Public Health Service Task Force on Women's Health Issues identifies five social factors which affect health and also apply to nutrition: cultural and social values, which are at the heart of issues of body size; economic status, which is associated inversely with nutrient per food dollar expenditures; labor force participation, where working mothers make less money than fathers; family, household

structure, social supports, and health, where the single parent has limited resources; and interactions with a health care system that frequently identifies the woman as the victim of the problem when actually the system is the source of the problem.

Fourteen of the 40 conditions described in the report mention nutrient changes or weight maintenance. Twelve other conditions have been added to the list.

Four categories of women, based on their roles, are used to discuss major nutrition issues. The youth role focuses on body image and preoccupation with weight control. The childbearer role emphasizes the demand and burden of pregnancy because the outcome of pregnancy is linked with many behaviors during pregnancy. The menopausal woman role is that of the older woman and the health consequence of life-long dietary habits and the frequent "victim" position to which she is relegated when using the health care system. The gatekeeper role sends messages to the marketplace through demand and directs purchases